

CLAIMS

1. 1. A method of regulating methanol concentration in a direct methanol fuel cell sys-
2. tem comprising:

3. providing a concentration regulator, coupled to a source of methanol or a source
4. of water or both, and responsive to a control signal for increasing or decreasing the con-
5. centration of methanol supplied to a fuel cell;

6. periodically short-circuiting a load driven by said fuel cell;

7. sensing the short circuit current produced by said fuel cell;

8. comparing said sensed current to a reference; and

9. generating said control signal in response to said comparison.

1. 2. The method as in claim 1 wherein one or more of said sensing, comparing and
2. generating steps is performed by a microprocessor or microcontroller.

1. 3. A direct methanol fuel cell system comprising;

2. a direct methanol fuel cell;

3. a source of air or oxygen coupled to the fuel cell;

4. a source of methanol;

5. a source of water;

6. a detector for detecting changes in a short circuit current produced by said fuel
7. cell and responsively producing a control signal; and

8. a concentration regulator coupled to the methanol source or to the water source or
9. to both sources, detector and anode of said fuel cell, responsive to said control signal for
10. varying the concentration of methanol in said fuel cell.

1. 4. The system as in claim 3 wherein said concentration regulator comprises a me-
2. tering valve, a pump, or a combination thereof.

5. A method of regulating methanol concentration in a direct methanol fuel cell sys-
tem comprising:

providing a concentration regulator, coupled to a source of methanol or a source of water or both, and responsive to a control signal for increasing or decreasing the concentration of methanol supplied to a fuel cell;

- 5 sensing one of a group of fuel cell operating characteristics including potential across a load driven by said fuel cell, potential across a portion of a fuel cell stack, potential at a portion of an anode of said fuel cell which is proximate to an end of a methanol flow path, an open circuit potential of said fuel cell, a short circuit current of said fuel cell and, periodically, alternately sensing another one of said group of fuel cell operating characteristics; and
- 10 using said alternately sensed operating characteristics to control a concentration of methanol in said fuel cell.